PLAUSIBILITY OF BEAUFORT SEA OIL PRODUCTION

BY THE MID—1980's

Presented by
G. R. Harrison
Senior Vice-President, Dome Petroleum Limited

To The
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On
Offshore Hydrocarbon Development

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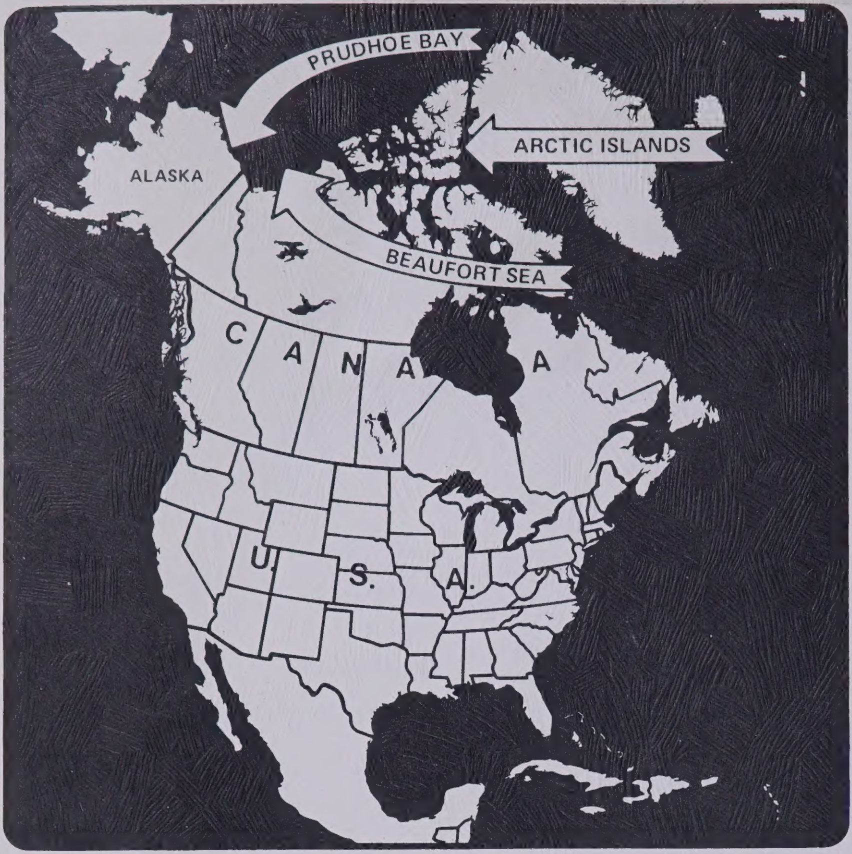
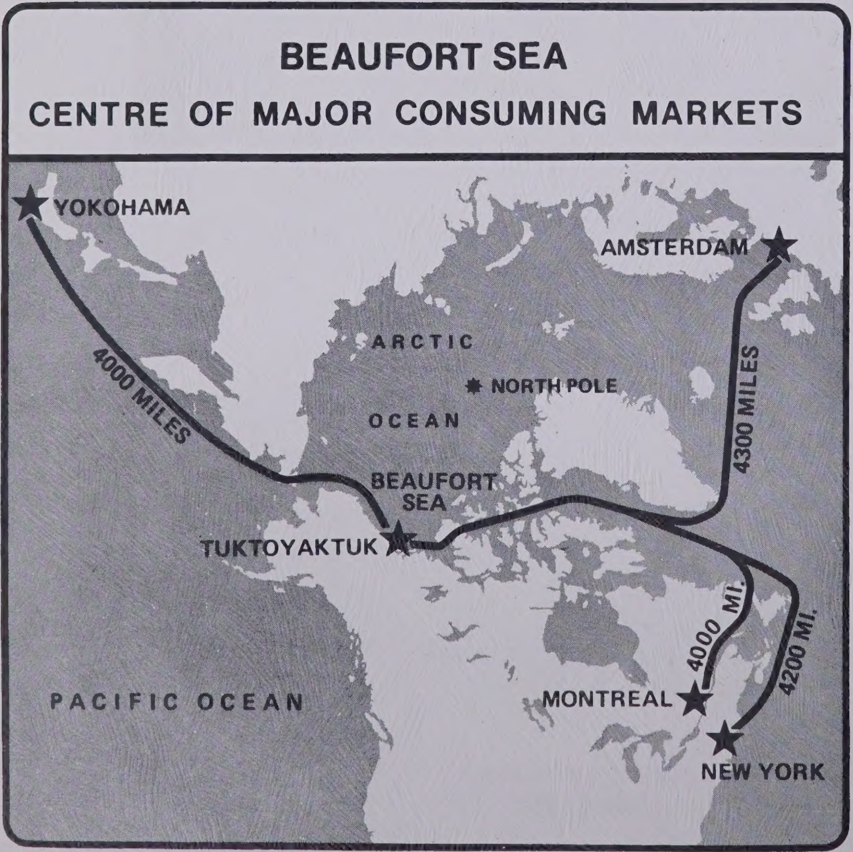


The Beaufort Sea is at the mouth of the Mackenzie River in the western portion of North America's Arctic Ocean. The exploratory operations in it's outer waters are being conducted in Canadian waters 350 kilometers north of the Arctic circle, and 500 kilometers east of the giant oil and gas field at Prudhoe Bay.


BEAUFORT SEA

CENTRE OF MAJOR CONSUMING MARKETS

The Beaufort Sea is equal distance from major oil consuming markets in Japan, Europe, and the east coast of North America. It is 1/3 the distance from east coast markets to the Beaufort as it is from east coast markets to the Persian Gulf. Thus cost increments to Beaufort transportation caused by ship icebreaker requirements are partially offset by the substantially lower transportation distances to market.

PLAUSIBILITY OF BEAUFORT SEA OIL PRODUCTION
BY THE MID-1980's

Is it feasible for oil discovered in the Arctic Ocean to get on-stream by the mid- 1980's and displace most or all Canadian oil import requirements by 1990? It clearly is.

Whether it will occur depends only on continuation of pace of activity and luck in the offshore search for oil and gas now underway using the first Arctic marine drill systems by Dome and partners in the Beaufort Sea.

To some this will be a startling contention. The Arctic Ocean is supposed to be mysterious with the forces and behaviour of the ice, the long darkness and intense cold forbidding to man and his technology.

Until recently this was so. Clearly, even five years ago the possibility of exploratory drilling in the Arctic Ocean was in serious question. Offshore Arctic production was even more in doubt and guessed by many to be neither economically feasible nor environmentally safe before the early 21st century.

What has caused such rapid change? Three things:

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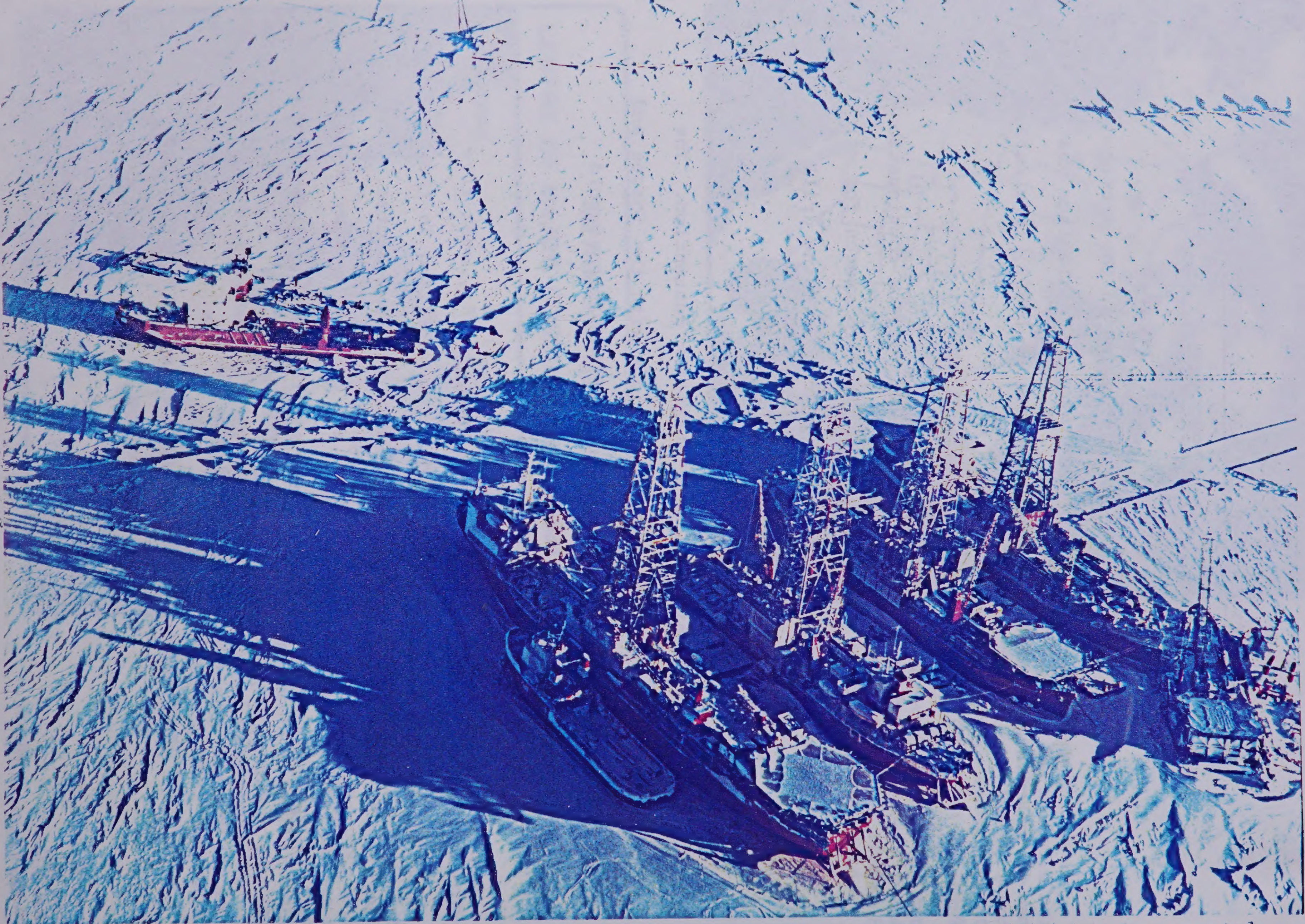

Dome's specially designed Arctic Drillships wintering in McKinley Bay, a medium depth artificial harbour created by Dome using the Aquarius Dredge Ship during the fall of 1979. Several of the icebreaking supply vessels are shown adjacent to the drillships and the experimental icebreaker, Kigoriak, is shown in the upper left hand corner.

1. Vision and courage by men of politics and Government such as Jean Chretien who as Minister for the North authorized in principle the exploratory project back in 1974. (Courage is always required by politicians who are before their time and before the public fully recognizes the need).

2. A sector of Canadian Industry with sufficiently strong convictions about future energy needs of Canada and the oil and gas prospectiveness of the Beaufort region to take large and risky investments and to pioneer technology through intensive R and D.

3. Government at both political and public service levels which astutely created a workable balance between a carrot of tax incentives to stimulate the exploratory activity and a heavy stick to demand rigorous compliance to the toughest drilling and environmental regulations yet devised.

Results from both drilling and concurrent R and D activities show the Beaufort Sea could soon enter a stage

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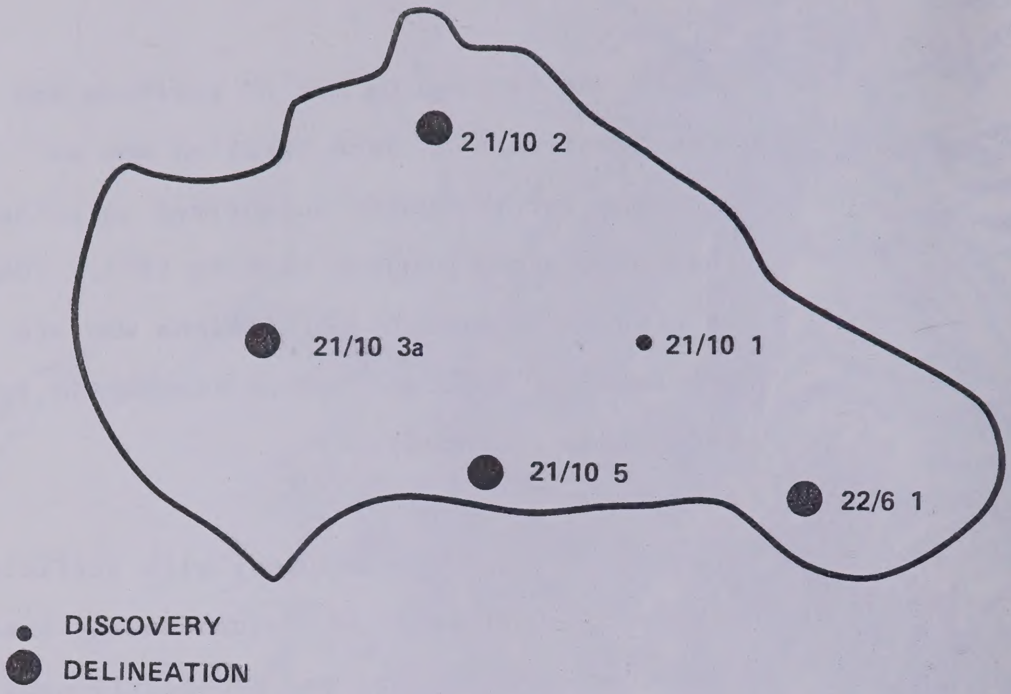
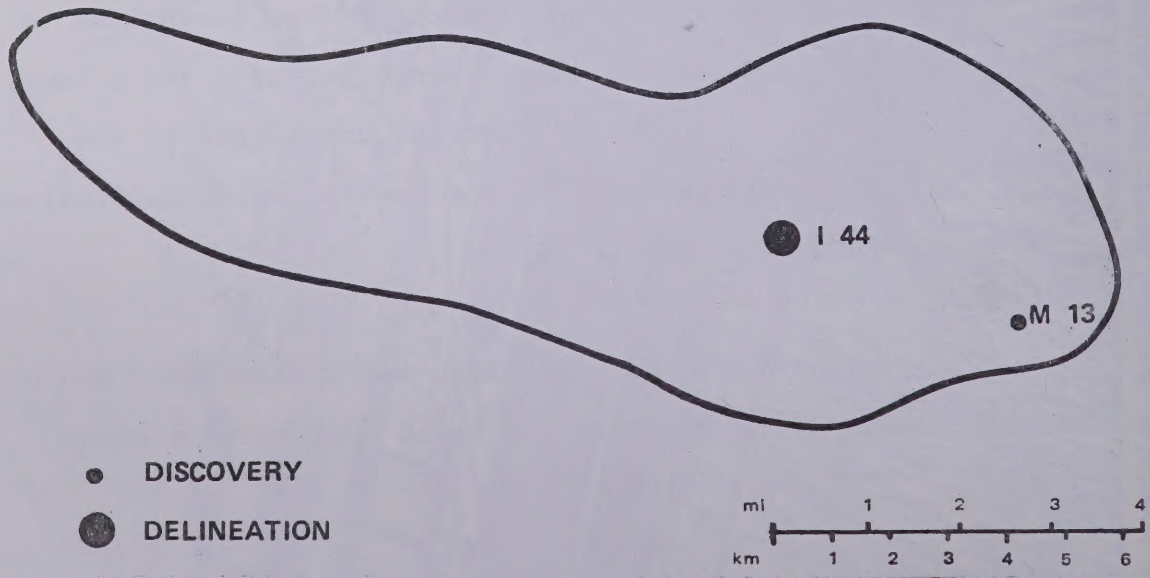
FORTIES FIELD



Reservoir area outline of 22,000 acres as confirmed by 4 step-out wells following original discovery.

KOPANOAR STRUCTURE



Reservoir area outline as indicated from seismic data and the single discovery well M-13. The first step-out well, I-44, should be completed during the 1980 drilling season. Additional step-outs will be required to establish the size of the reserves in this structure before commerciality can be established and major development committed to.

of oil and gas development. Well bores have penetrated thick beds of reservoir rocks. Production tests have given encouraging flow rates of oil, gas and condensate in several wells. The prolific oil discovery made in 1979, the seismic interpretations and the geological setting indicate the Kopanoar structure is potentially similar in size and productivity to the giant Forties Field in the North Sea.

Advanced environmental and engineering knowledge from the R and D program has enabled concepts to be developed which hold certain promise that offshore production in the Beaufort Sea and marine transportation through the Northwest Passage will very soon be economic and environmentally safe.

The central objective of the 1980 Fairmont Workshop has been stated to "identify the relevant environmental considerations that must be addressed to allow orderly and effective development of Canada's offshore hydrocarbon developments".

Where energy and environmental planning is under discussion, it is essential to reiterate the alarming backdrop that exists to the energy picture. The vital fact is that stability of energy supply to western society is critically dependent on one single nation in the Persian Gulf - Saudi Arabia. As things stand now the necessary supplies

of oil to fuel our factories and heat our homes can be cut off without warning at any time. The time required however to fully replace present offshore supplies from Canadian sources, such as frontier lands or the Athabasca tar sands, will be a decade even with the best of planning and the most vigorous implementations. Consequently, the loyalties and competence of the Saudi Arabian army has become as important to the economic well-being of the average citizen in our western society as whether that citizen shows up for work in the morning.

Encouragement to accelerate the on-stream dates of major energy projects such as the Beaufort Sea is not only needed to avoid serious energy shortages. Such encouragement is essential to responsible environmental planning. One of the ironies of delays to energy projects caused by environmentally concerned sectors will be the heavy toll paid in future environmental degradation. Gains made in environmental standards in both the U.S. and Canada during days of energy surpluses will be callously reversed as the public mood changes with serious energy shortages. Consequently planning which is forcefully applied to chop every day possible from the time required to place all major energy projects on-stream, not only ensures a continuation of present life-styles in Canada but offers the best hope for protection of the environment.

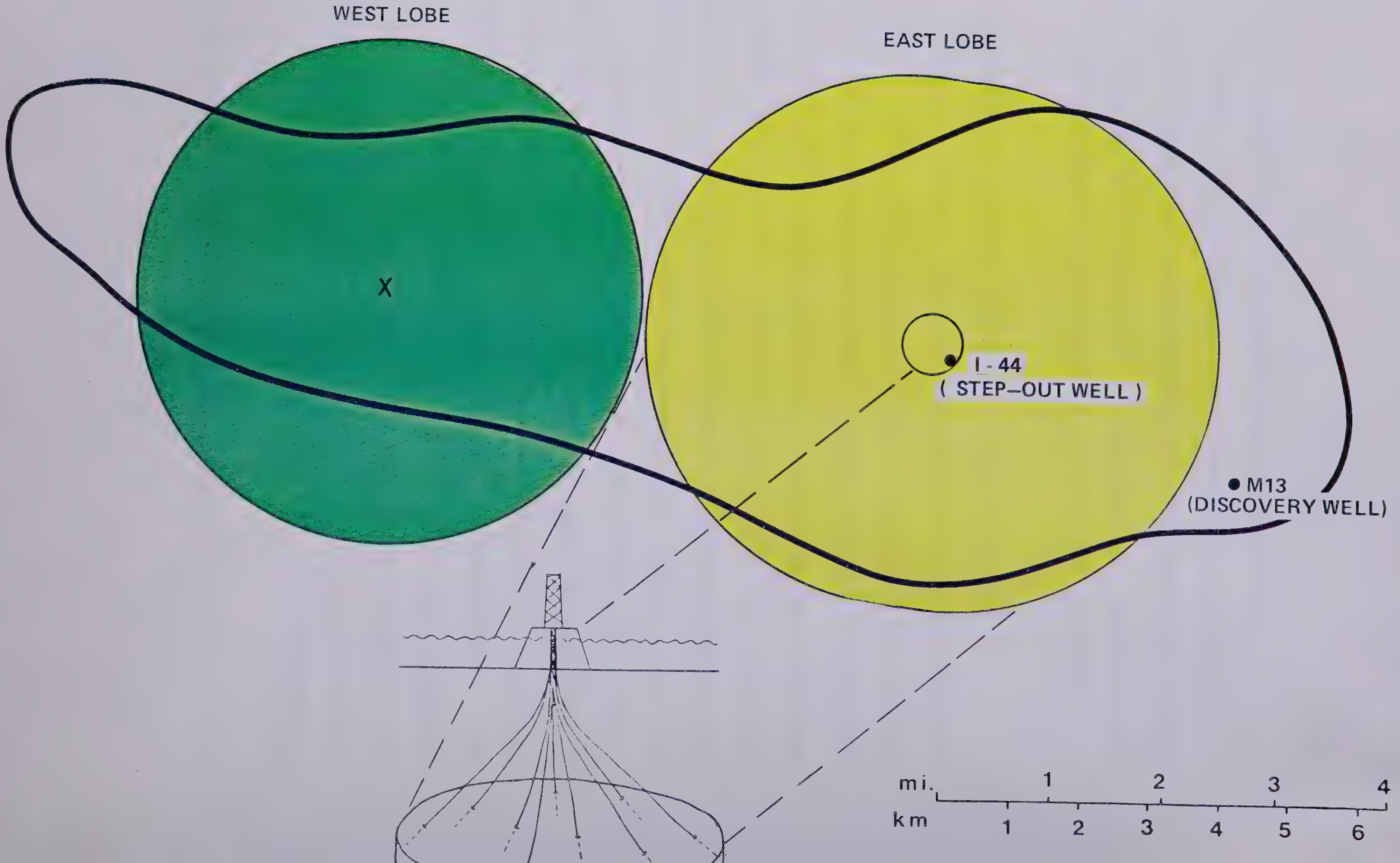
Accordingly, the sponsors of this workshop are to be commended for the excellent balance in the agenda material designed to give participants knowledge not only of environmental implications of development but in the economic and technical feasibility of potential energy projects.

Several things are needed before development of Beaufort Sea oil and gas can proceed. First it must be proven that commercial size reserves exist which, stated another way, means that at least 400 million barrels of oil reserves are recoverable to one production platform. It must be proven that acceptable knowledge exists of ice forces and in the performance of a production platform system subject to such ice forces. Confidence must be achieved in the cost expectations of constructing such a platform system. It must also be proven that an acceptable knowledge exists of the predicted performance and attendant cost of tankers loading oil in the Beaufort Sea and moving it through the Northwest Passage to markets. Finally, it must be shown that environmental risks can be reliably predicted for both production and transportation activities and that such risks are acceptable.

Where do we stand then on each of these matters?

KOPANOAR

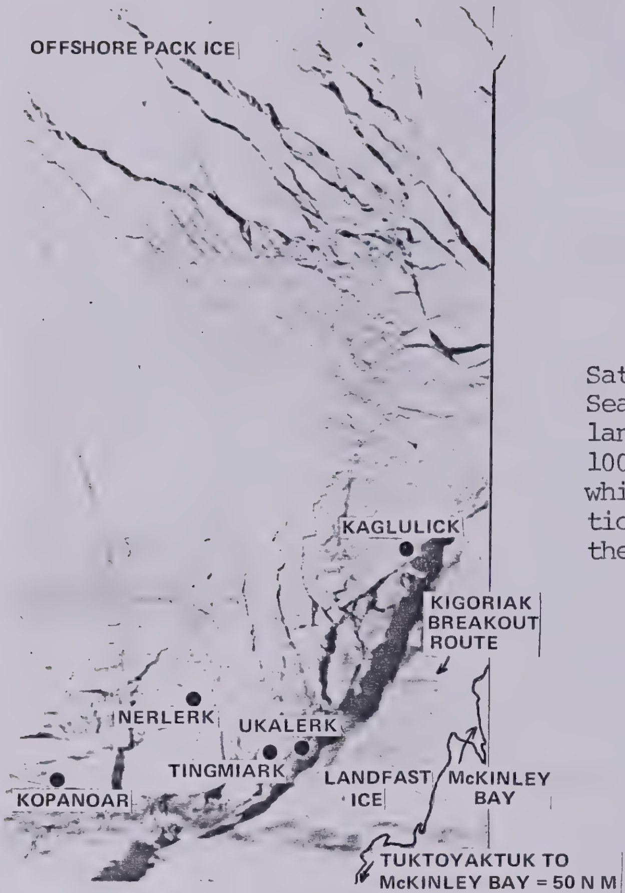
INDICATED OIL RESERVOIR OUTLINE
AND TENTATIVE DEVELOPMENT AREAS



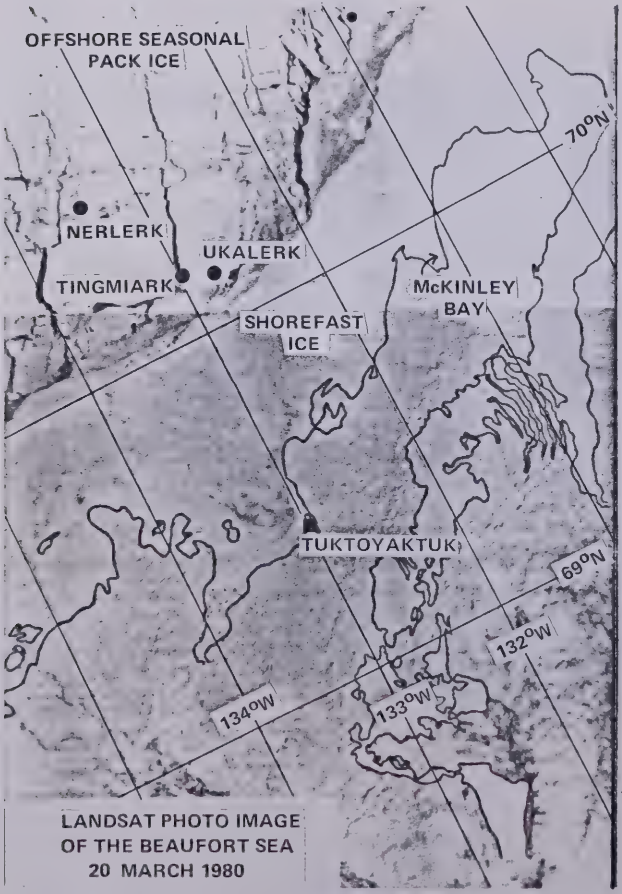
1. COMMERCIAL RESERVES

At present Kopanoar is the most promising structure for development as a result of the very prolific rates of oil produced at a discovery well in 1979. Although seismic interpretations indicate that there is sufficient reservoir size for a commercial field, additional drilling in the structure will be required to establish sufficient confidence level in reserve estimates. Two phases of development are indicated at the Kopanoar structure - the east lobe and the west lobe.

The first phase (east lobe) could be justified with two step-out wells. The first step-out will be drilled in 1980 at a distance 2 1/2 miles from the discovery well. The second step-out could be started this year and could be completed early in 1981. Favourable results from the first step-out in 1980 would permit major construction planning to be undertaken, but the results of the second step-out will likely be needed before major investments in



Satellite photo showing the Beaufort Sea shoreline, a 40 kilometer band of landfast ice along the shoreline, the 100 kilometer wide transition zone which encompasses the drilling locations and the permanent polar pack to the far north. Taken in March of 1980.



A second satellite photo taken in March of 1980, showing more extensive portions of the shore including Tuktoyaktuk, the location of Dome's operating base and McKinley Bay where the drillships are wintered in a medium depth harbour created by dredging in 1979.

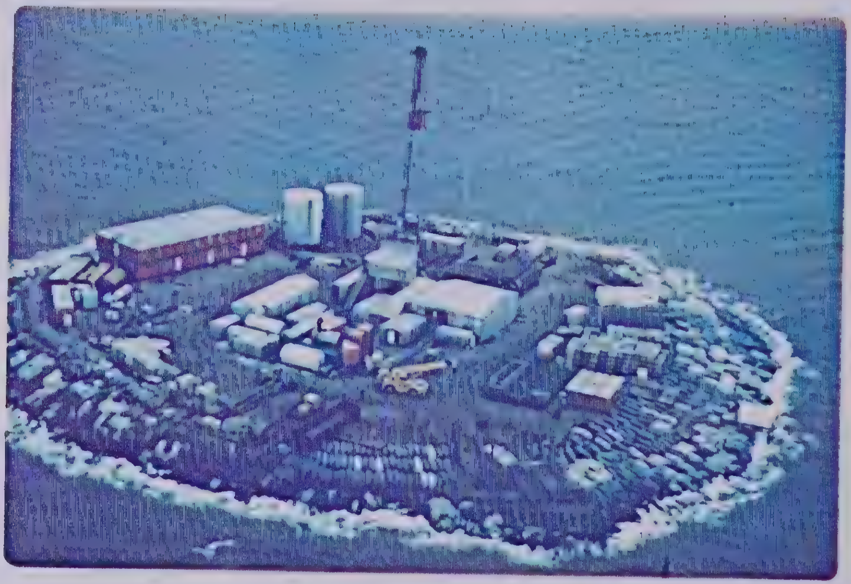
It is now apparent that there are three orders of magnitude of force that might be designed against:

- level ice combined with pressure ridges 35 meters in depth-very common,
- multi-year hummock fields 15 to 30 meters in thickness and up to 5 kilometers in diameter-rare occurrence,
- ice islands which calve from Ellesmere Island glaciers and which can be 60 meters in thickness and 7 to 15 kilometers in diameter-very rare occurrence.

On the basis of present knowledge it is concluded that fixed structures in the Beaufort Sea should be designed for possible collision by the largest but rarest of these three features, namely the ice islands.

3. ACCEPTABLE KNOWLEDGE OF PLATFORM PERFORMANCE AND COST

The ice which appears in various forms and sizes as described earlier is usually present for at least nine months of the year but can be

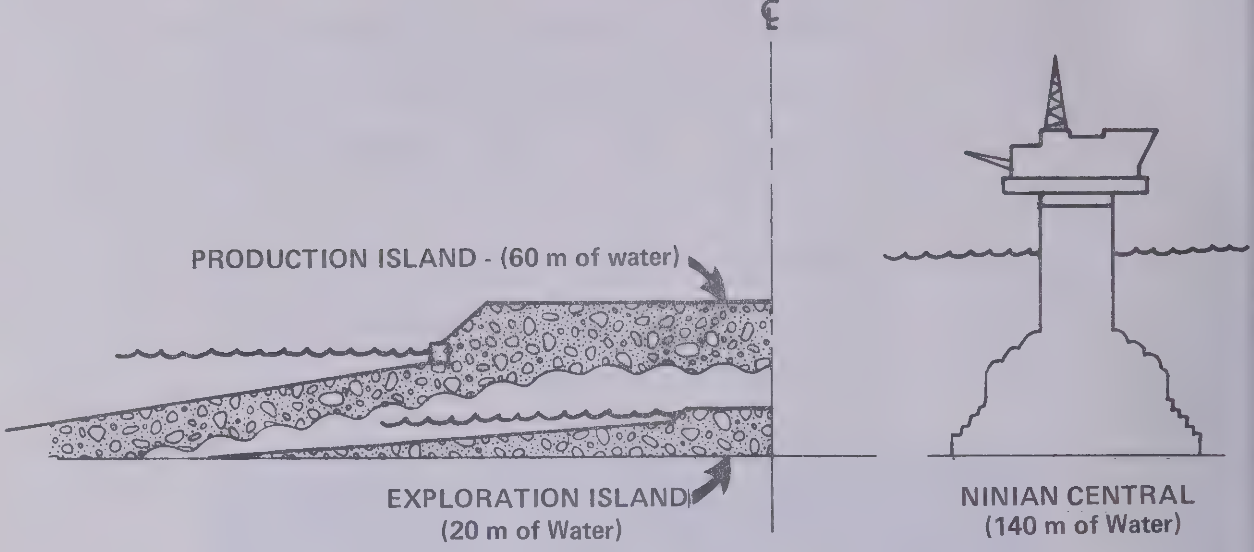


One of the 17 artificial earth islands that have been constructed in the Beaufort Sea for the purpose of exploratory drilling. Imperial Oil has methodically developed the technology. They started in the very shallow waters and during the summers of 1978 and 1979, in partnership with Gulf of Canada, constructed one in 20 meters of water. These islands have been built in the inner waters where ice forces and movement are less severe than in the deeper waters where Dome and partners are exploring. Nonetheless, this experience over almost a decade is of enormous value in determining the environmental effects of constructing such islands and in understanding their interaction with ice.

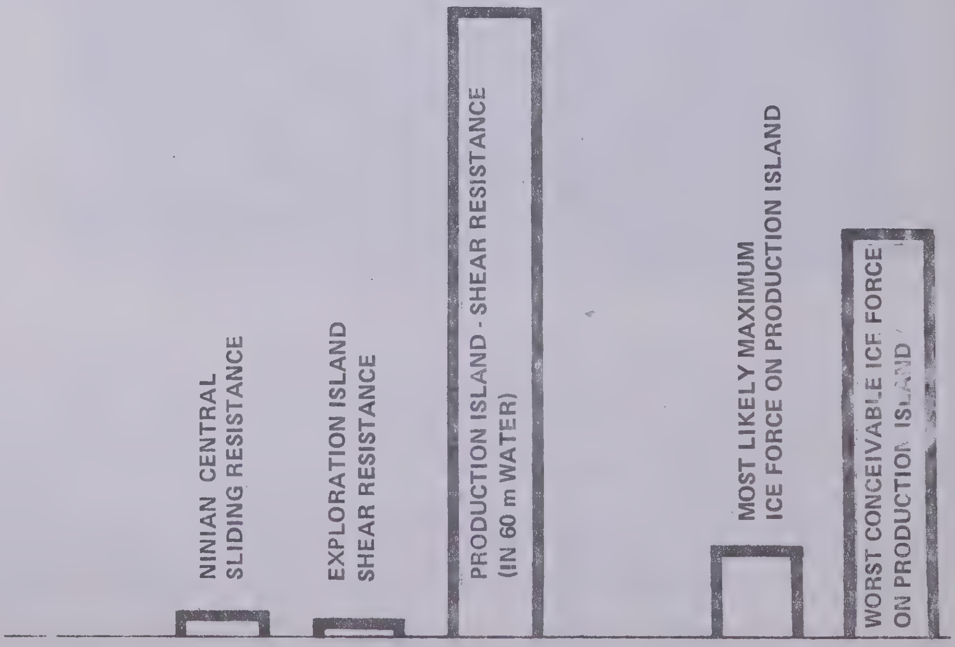
present at all times of the year and can move at any time under the action of winds and currents. Even in the landfast ice zones the ice movement can be sufficient to cause large lateral ice forces. It is these large ice forces which require offshore platforms to be different from those in other regions. Beaufort platforms need to have large lateral shear strength to resist the ice.

Industry, principally Imperial Oil, has developed valuable history with artificial earth islands in the Beaufort Sea. Seventeen exploratory drilling islands have been built (the latest in 20 meters of water) and none have been adversely effected by the ice, - no shearing failures have occurred and no ice over-ride has been experienced.

It is of course acknowledged that ice conditions get more severe in the deeper water; the ice is more mobile and thick multi-year and glacial ice features can be present. Hence, earth islands in deeper waters need to be stronger by a substantial margin than those that have been built to date.



RELATIVE PROFILE SIZE OF NINIAN PLATFORM IN NORTH SEA, WITH ACTUAL EXPLORATION ISLAND AND PROPOSED PRODUCTION ISLAND IN BEAUFORT SEA.



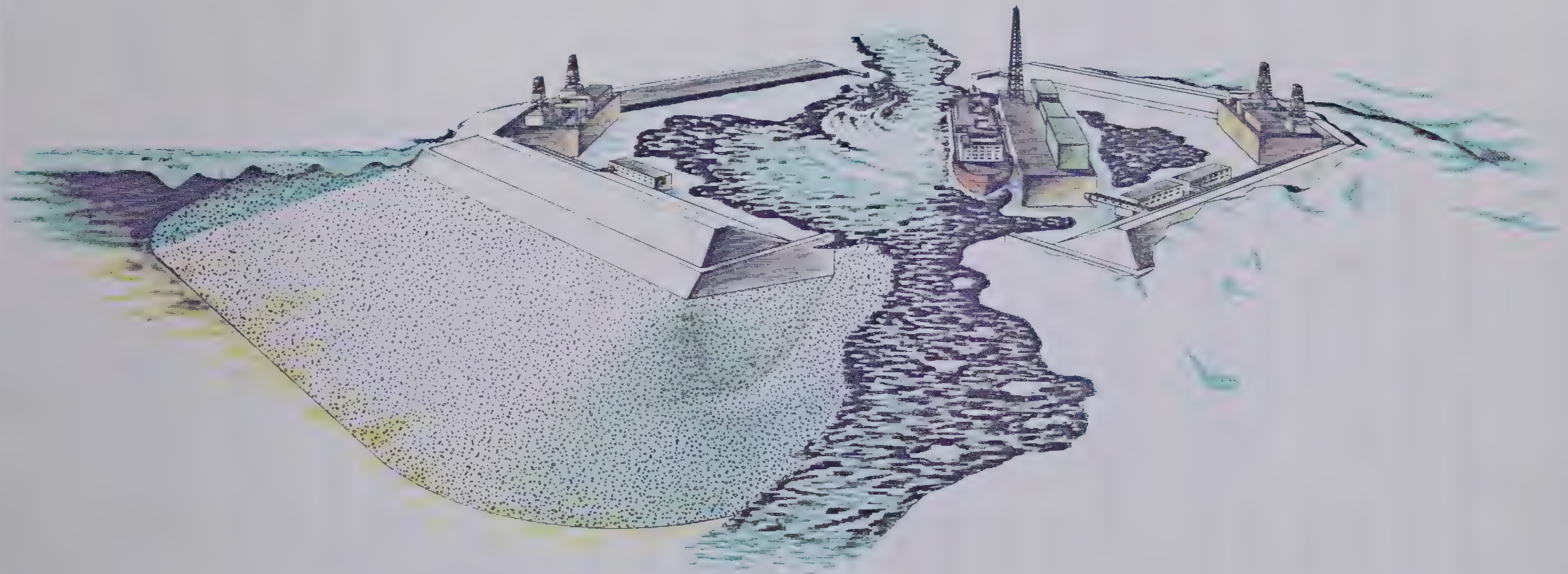
RELATIVE SHEARING RESISTANCES AND FORCES

SHEAR RESISTANCES OF SEVERAL BOTTOM-FOUNDED STRUCTURES RELATIVE TO POSSIBLE ICE FORCES IN BEAUFORT.

The shearing resistance of an earth island is roughly proportional to its volume above the water line. Hence the increased resistance needed for production islands in the deeper waters can be achieved by creating an island larger in diameter and with more freeboard.

A typical exploratory island is about 100 meters in diameter whereas a development island will be made at least 500 to 600 meters in diameter. Furthermore, the freeboard of an exploratory island is typically only 3 to 4 meters whereas a development island will have at least a 25 meter freeboard. Consequently, a development island will have a shearing resistant 50 to 100 times greater than islands built to date in the Beaufort Sea. This will give a shear resistance equal to 10 times that of the largest ice force that could be imposed upon it.

Research on ice over-ride indicates that it can be successfully avoided by suitable beach geometry combined with the higher freeboards which will be provided in any event to achieve the desired shear resistance.



ARCTIC PRODUCTION AND LOADING ATOLL
(APLA)

The artist's sketch opposite shows an artificial earth island (APLA) conceived by Dome engineers which can totally resist all ice forces. After construction, process facilities and tanker loading facilities would be built on barges in southern shipyards and towed by icebreakers. These facilities would be protected in the internal basin from ice.

4. CONFIDENCE IN COST ESTIMATES

To construct the APLA, it will be necessary to conduct certain operations and function within an environment never yet experienced by industry. In addition there are certain gaps in technology which are yet to be filled.

The scope of the work which must be undertaken to build a production island is several orders of magnitude larger than required for the largest exploration island so far built in the Beaufort Sea. The volume of material required for the production island will exceed 70 million cubic meters as opposed to 2 million cubic meters of material used in the largest

Photograph of the Cutter Suction Dredge 'Aquarius' engaged in dredging the approach channel and artificial medium-depth harbour at McKinley Bay in the Beaufort Sea. This is a self-propelled, ocean-going, rock-cutter with 18,000 HP. It is one of the largest of it's kind in the world and capable of working in up to 25 meters of water depth. The material excavated is pumped through the 36" floating pipeline. In this case, the pipeline is about 1,000 meters long, but pumping distances of 10 to 15 kilometers are possible.

Photograph of the 3,000 HP Cutter Head used on the Aquarius. The cutter head is 3.5 meters in diameter, has exchangeable teeth and is capable of cutting rock of medium hardness. During the 1980 spring season, experiments will be conducted to determine it's effectiveness in cutting ice. If effective in cutting ice, exciting expectations exist that this dredger vessel could clean up large spills of oil mixed in sea ice.

exploration island built to date. There have however been marine projects of similar scope conducted elsewhere in the world.

1. In 1933, the Zyder Zee Dike in Holland was built through the stormy shorelines of the North Sea using 30 million cubic meters of sand and 13 million cubic meters of boulder clay.

2. Maintenance dredging in the Port of Rotterdam removes 30 million cubic feet of sand and silt annually from the river channels.

3. Between 1976 and 1979, the Port of Jubaij in Saudi Arabia was created by excavating 35 million cubic meters of rock and compact sand.

4. In the eastern Scheldt of Holland storm surge barriers on the Rhine delta using earthern material and concrete piers along 9 kilometers of exposure to North Sea storms in up to 6 knots of current and at a cost of 2 to 3 billion dollars.

Photograph of a Trailer Suction Hopper Dredge which is like an ocean-going self-loading dump truck. The vessel loads by lowering the dredge pipe over the side to the bottom of the sea and sucking up material that it cuts from the sea bottom with a drag head. It dumps it's load by opening a set of bottom doors.

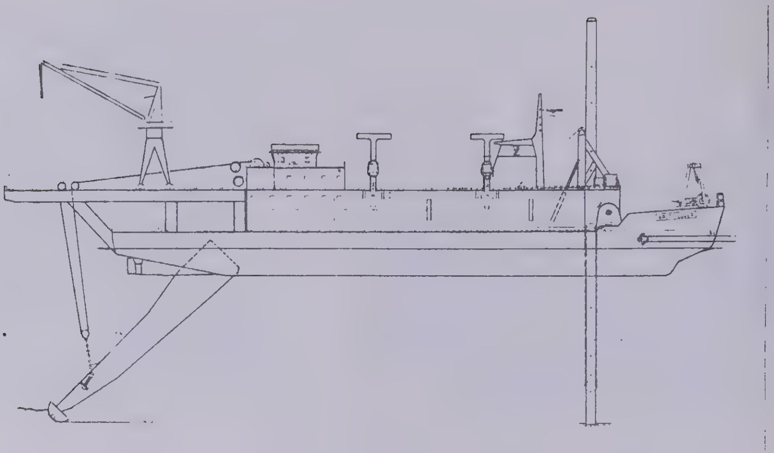
Development work is also underway which is promising to make these vessels very effective as high rate oil cleanup systems with capacity to function in high sea states. A small trailer dredger is now on order by the Port of Rotterdam to conduct experiments. Floating skimmerheads on each side of the vessel would suck up oil and water. After separation from the water the oil would accumulate in the hoppers.

Photograph showing a 14 ton Drag Head on the Trailer Dredger being lifted on board again after terminating loading operations. The suction pipe shown here is 36" in diameter. The current designs of these dredges have capacities to haul up to 10,000 cubic meters. To meet the scale of operations required for production islands in the Beaufort Sea, redesign of the vessels will be required to take them from current operating depths of about 35 meters to 80 meters and give them hopper capacities of 20,000 to 30,000 cubic meters.

Projects such as these have naturally created highly advanced soil engineering techniques and have also stimulated the technology of dredging systems to handle higher rates of production, operations in deeper waters and greater soil handling efficiencies.

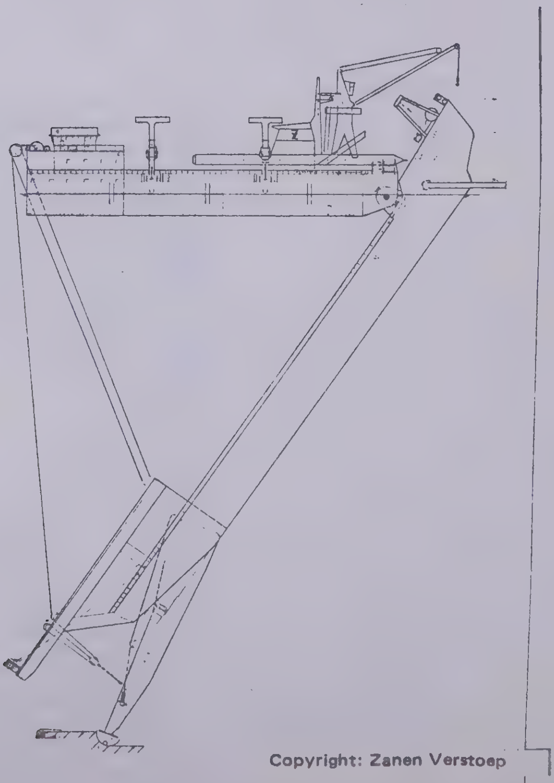
Nonetheless, construction of a production island in the deeper waters of the Beaufort Sea will experience unique problems of construction. Sea ice will make construction operations difficult. Water depths of 60 meters or more have never been worked before by dredging systems. The insitu material at the construction site is far from favourable consisting first of layers of soft clay, then fine 100 micron sand and intermittent layers of permafrost. Finally the distance to borrow areas for more suitable material may exceed 100 miles

It will be necessary to develop new equipment for dredging, moving and placement of earth material. Such equipment must extend the working season in the ice, work at greater depths, work with larger quantities and longer



Copyright: Zanen Verstoep

Configuration of the Aquarius with its present ladder, which supports the cutter head and lowers it to the bottom. It is capable of dredging to 25 meters below water level. The particular weight and structural strength of this ladder limits the operation of this dredge to the 25 meters of water depth.



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Configuration of a Cutter Suction Dredge in the conceptual design stage by Zanen Verstoep, which is expected to permit operations to water depths of 80 to 100 meters. Cutter power of up to 5000 HP could be applied at this depth since a portion of the ship's hull structure is being used to provide the necessary strength and weight of the ladder.

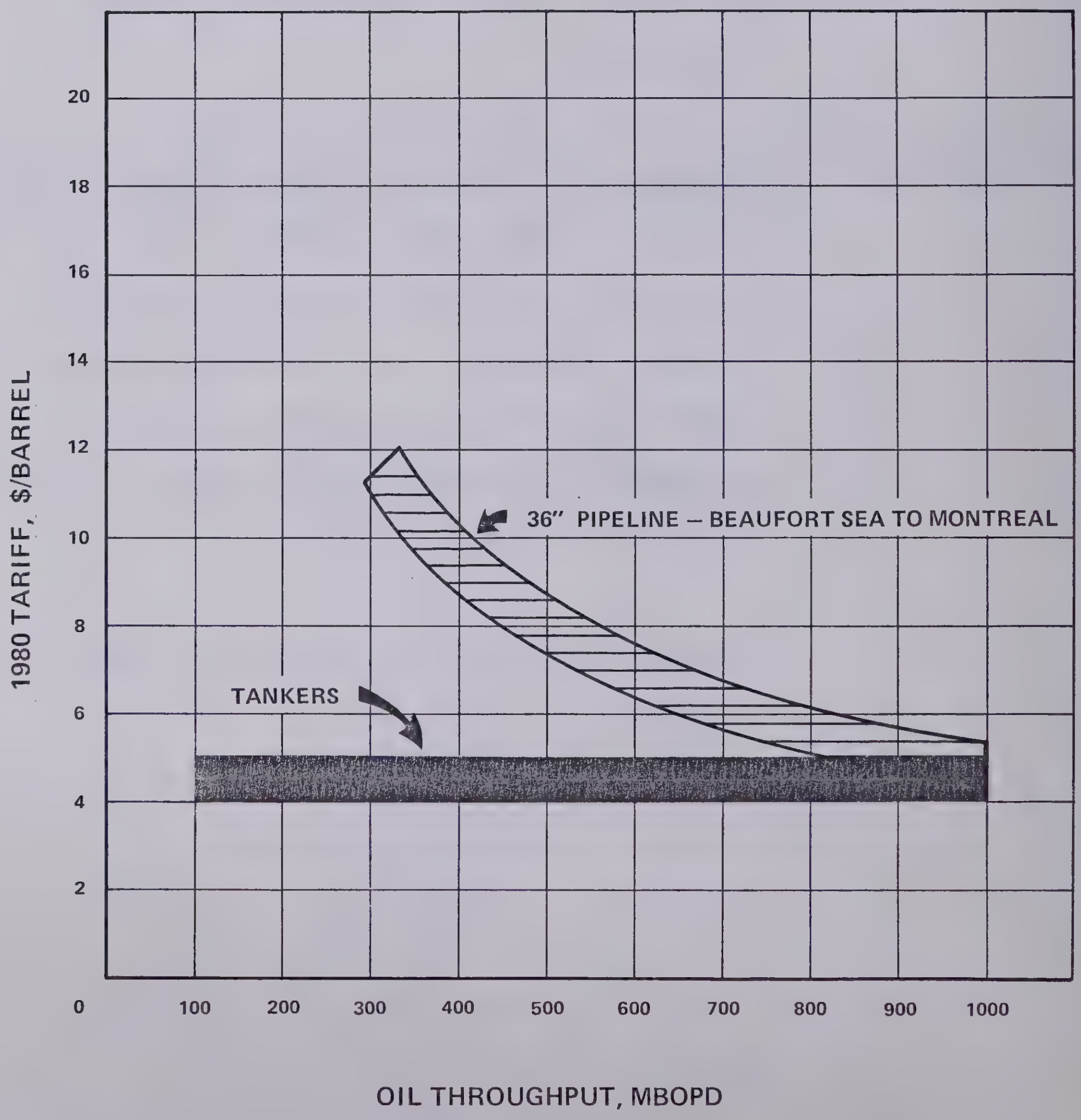
hauls and be able to more accurately place material than that available from present technology.

Furthermore, new techniques must be developed to create steeper slopes for underwater sand structures, stabilize the sub-soil and create protection in the ice wave zone during construction.

In spite of these challenges, engineering studies to date make it evident that the technical problems of construction can be solved. Moreover, it is evident that new generation dredgers designed for deeper water and larger scale can substantially lower the unit volume costs.

Financially feasible platforms now seem assured.

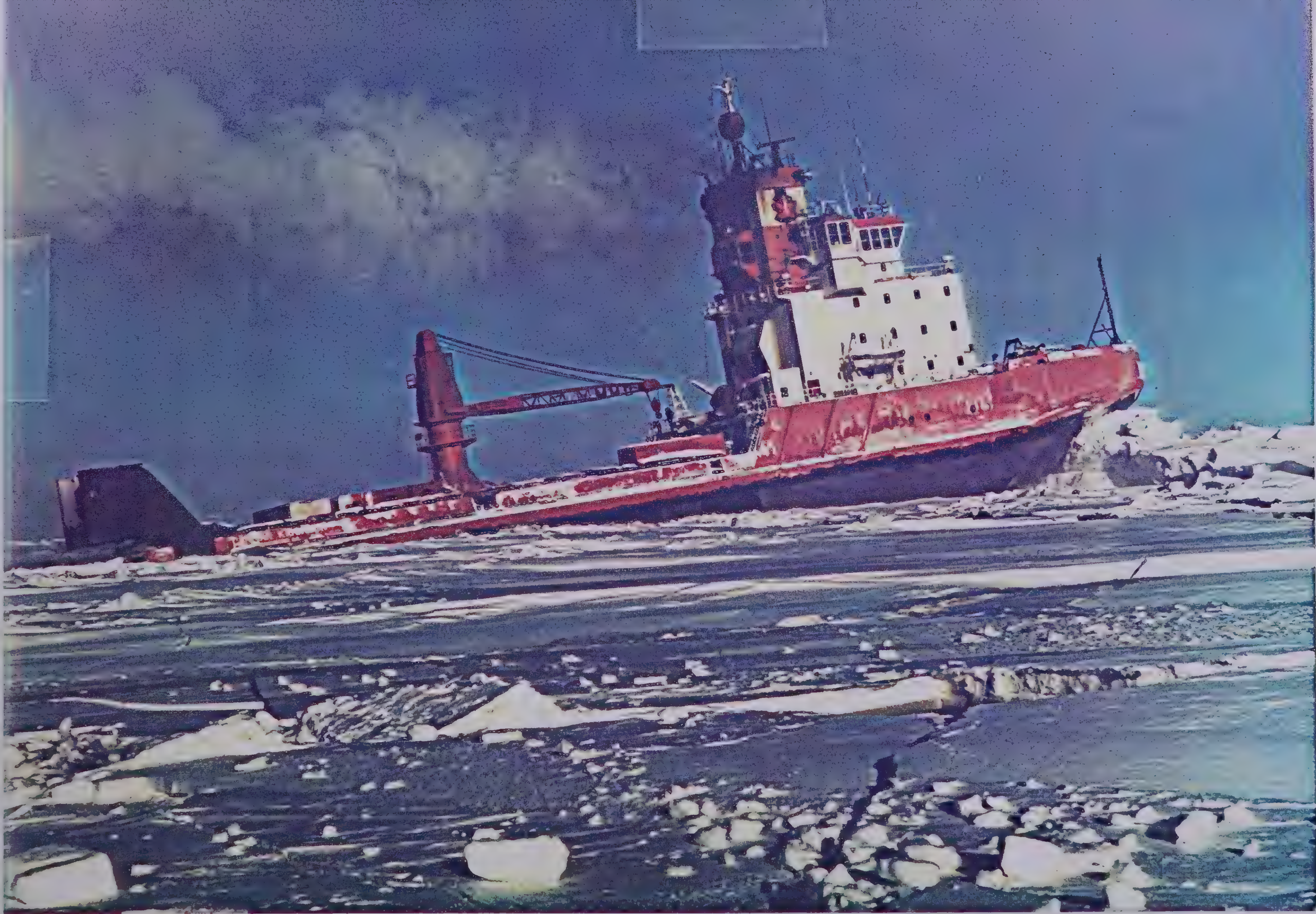
COST OF MOVING OIL TO EASTERN CANADA FROM
BEAUFORT SEA BY TANKER VS PIPELINE
(CONSTANT 1980 DOLLARS)



5. ACCEPTABLE KNOWLEDGE OF ARCTIC MARINE TRANSPORTATION AND COST

The graph opposite shows the comparative cost of moving oil from the Beaufort Sea to eastern Canadian markets both by pipeline and by icebreaking tanker. Moving oil via tanker is economically more attractive until oil throughputs reach the range of 750,000 BOPD. But more important, the use of the tanker mode will permit development to proceed in the Beaufort Sea at a much earlier date since the marginal reserves required to justify tanker transportation is an order of magnitude lower than that required for the pipeline.

Based on a tanker capacity of 200,000 DWT, a suitable tanker hull design could transit all ice in the Northwest Passage unassisted throughout the year with a 150,000 HP propulsion system. The tanker could achieve 18 knots in open water and 6 knots in 10 feet of level ice with associated ice ridges. Based on a round trip distance of 4,000 miles between the Beaufort Sea and east coast markets and 3 port days per trip each tanker could complete



Dome's new icebreaker, Kigoriak, breaking a pressure ridge during experiments in the Beaufort Sea in March, 1980. The vessel has a number of important innovative features. She underwent extensive experimental activities intermittently over the entire 1979-80 winter. Aside from the enormous fund of knowledge gained about ice and icebreaking by these experiments, valuable operational experience was gained since this is the first

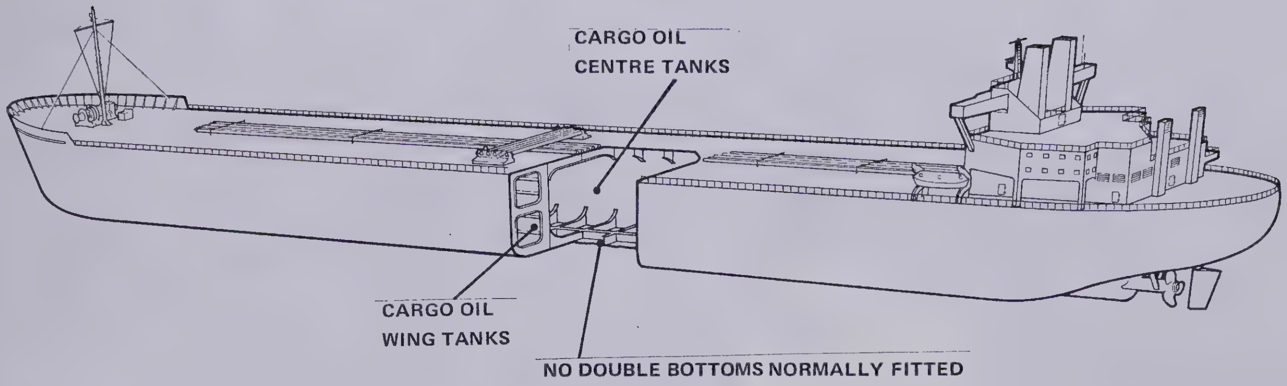
16 trips per year which results in a tanker capacity equal to 50,000 BOPD.

Our Company has constructed the icebreaker Kigoriak with numerous important innovative features to optimize the performance of icebreaking vessels. The vessel is undergoing extensive experimental testing in a wide variety of ice conditions throughout the entire Arctic winter to further optimize icebreaking capability of future vessels.

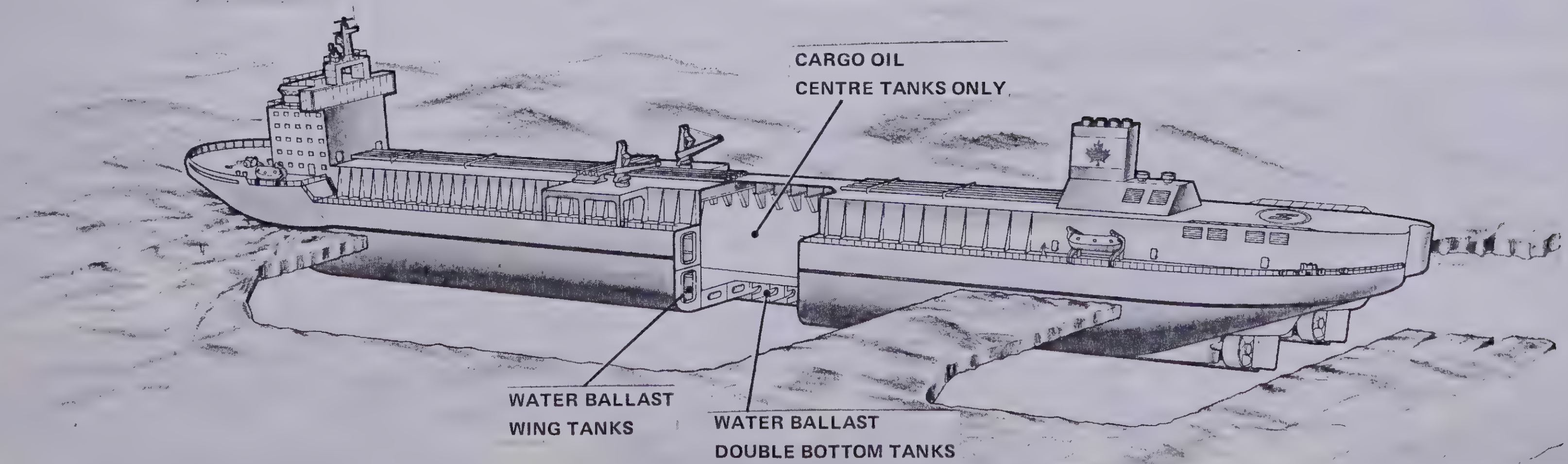
In order to remove the causes of tanker accidents and attendant oilspills our Company has attacked the design of an Arctic icebreaking tanker by first conducting a study of all tanker accidents that have occurred since January 1, 1967. It is now evident very substantial improvements can be made in tanker design which can minimize, if not completely remove, the possibility of an oilspill even if a tanker were to be involved in a collision or to run aground.

Naturally in addition to equipment design a major preventative measure that must be taken

CONVENTIONAL TANKER



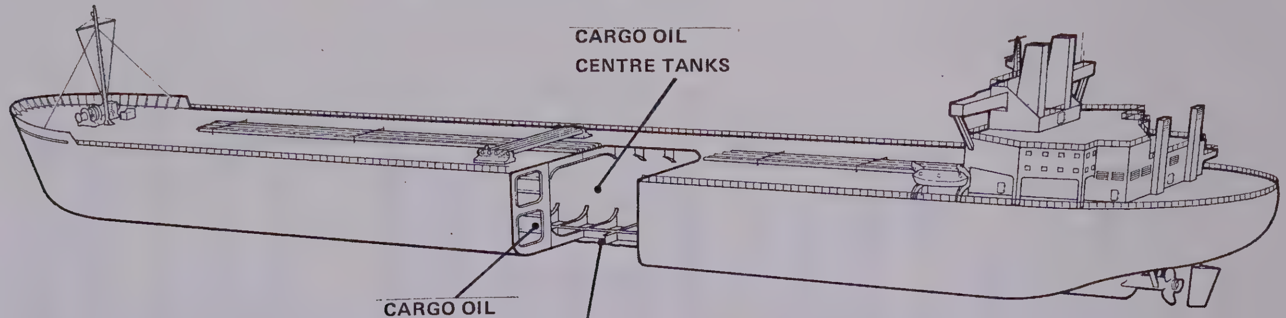
ICEBREAKING TANKE



SPECIAL FEATURES:

1. DOUBLE HULL SIDES & BOTTOM WITH WATER BALLAST
2. DOUBLE & INDEPENDENT STEERING GEARS
3. DOUBLE & INDEPENDENT PROPULSION SYSTEMS
4. LONGITUDINAL BEAM STRENGTH 3X CONVENTIONAL TANKER
5. EMERGENCY POWER SYSTEMS & DEBALLASTING CAPABILITY TO PERMIT RE-FLOATING IN CASE OF GROUNDING
6. INERT GAS SYSTEMS TO PREVENT EXPLOSIVE HYDROCARBON GASES

CONVENTIONAL TANKER



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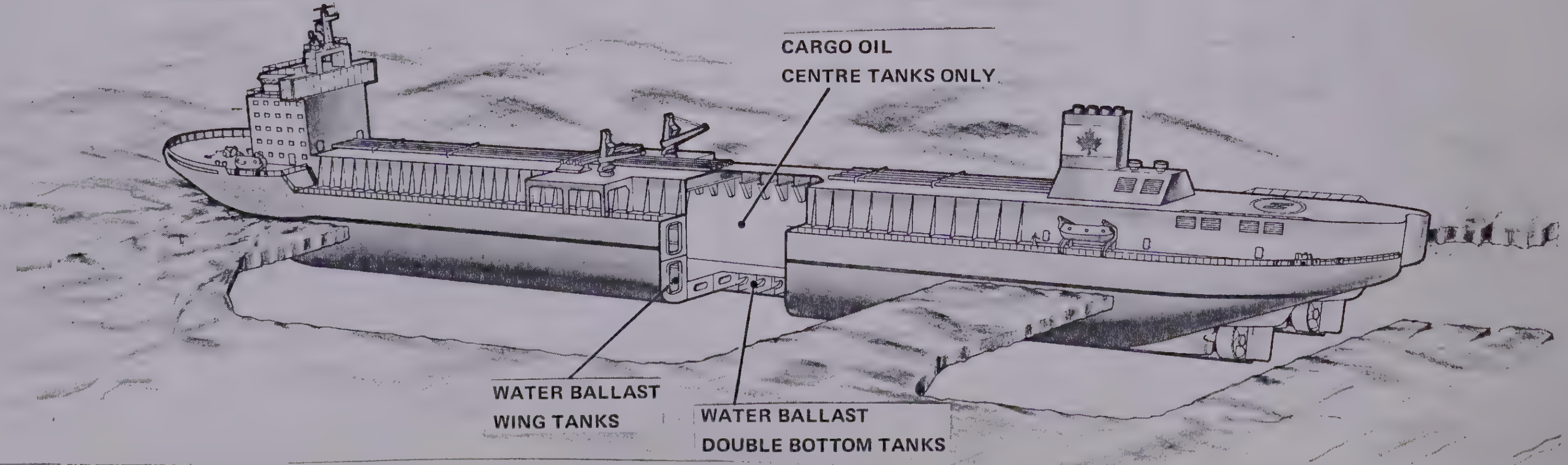

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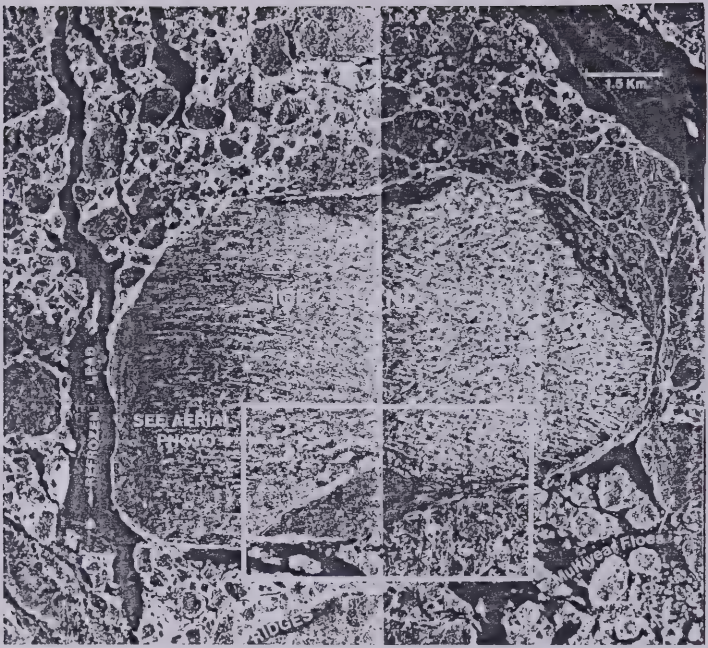
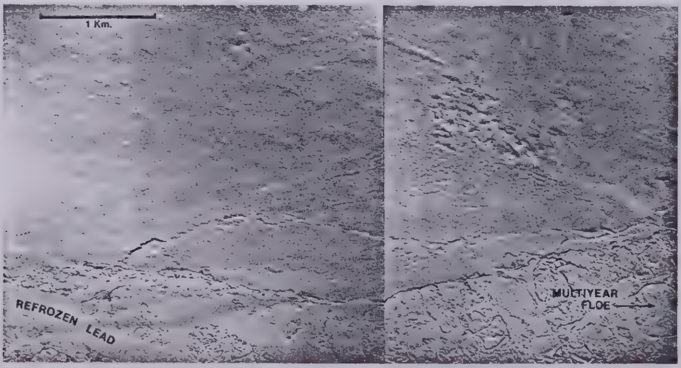
is to ensure that a well-seasoned, experienced captain and crew are employed.

In addition it is expected that enormous improvements in providing information to assist the manning of the tanker can be achieved through newly evolving technologies which can provide continuous navigational assistance and environmental observation and prediction.

One example of this technology worth noting is that of synthetic aperture radar or SAR. Carried by aircraft (or potentially by satellite) SAR produces radar images which can penetrate darkness, cloud cover and snow cover on ice and give a spectacular differentiation between different ice features. It can be expected that during a major Government sponsored initiative known as the SURSAT project (in which our Company and other oil Companies participate), SAR and other instrumentation will make rapid technological advances and to enhance ability to operate safely and efficiently using Arctic Marine Systems throughout the entire Arctic.



Synthetic Aperture Radar Image of Ice - obtained during SURSAT Project (Beaufort Sea Experiment) March, 1979, by SAR 580. Note the distinguishing appearance of multi-year ice, refrozen leads, ridges and the spectactular ice island T3. This imagery obtainable during day or night and irrespective of cloud, fog, blizzards or snow cover conditions. In the near future this imagery will be to the Arctic Ship Captain what the plumb line was to the early mariners. The T3 ice island broke off many years ago from the Ellesmere Ice Cap and has appeared in the Beaufort Sea region on 2 recorded occasions. These are the largest ice features which can be present and likely will set the design criterion for production platform design.



Aerial photograph of part of the area imaged by SAR (see insert on SAR image). Note inability to discern any useful detail below the snow cover and of course, photography must be conducted in daylight and in clear skies.

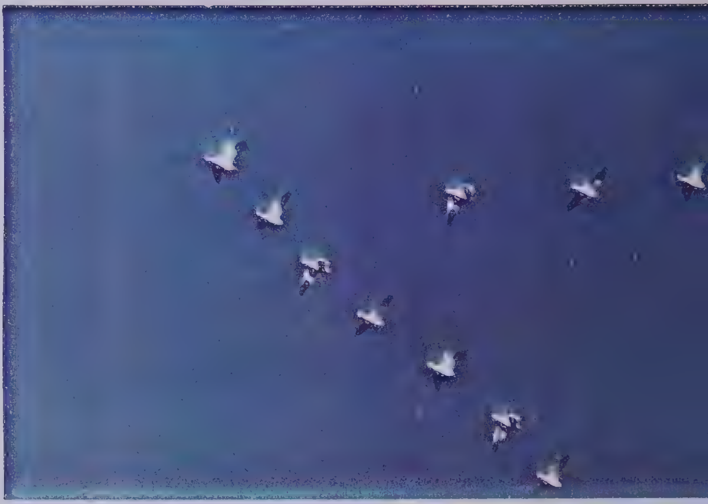
6. KNOWLEDGE OF ENVIRONMENTAL RISK

The Beaufort Sea is home to over two million migratory birds, some 80,000 seals, 2,000 polar bears, 6,000 whales and other animals. Included in this list are several species which rank high in terms of public consciousness most notably, the bowhead whale and the porcupine caribou.

The relationship of the native northerners to these important wildlife resources cannot be overlooked; nor the potential of wildlife in the development of tourism in the Western Arctic.

Arctic ecosystems are unusually sensitive. The land contains much ground ice, permafrost and unconsolidated material which, when disturbed without due care, can result in drastic long-term changes to the landscape. Rates of biological growth and decay are generally slow. Vegetation destroyed by land-based activities may take decades to recover. Many Arctic fishes do not reproduce until 5 to 10 years of age, and then not every year. Beaufort seals

Bowhead Whale in the Beaufort Sea



Birds off Yukon Coast

Porcupine Caribou near Komakuk

as well as whales, have low reproductive rates. These comments point out that animal populations, and the ecosystems of which they are a part, would generally be expected to be slow to recover from damage inflicted on them by man.

This does not suggest that development activity should be slowed in the Beaufort Sea. On the contrary. "Necessity is the Mother of Invention" may be a trite phrase but it is irrefutably true where oilspill prevention and cleanup are involved.

For example, for two decades fears of tanker spills have existed throughout the world - yet tanker design has not fundamentally improved. Driven by super-sensitive concern for Arctic ecology, tanker design will be revolutionized and hazards radically reduced. For oilspills, new ideas, maybe adaptation of dredging ship design, can also evolve rapidly even in sea-ice.

Towing of the 600,000 ton Ninian Production Platform out to the site in the U.K. North Sea where it will be placed in 450ft. of water.

> A society that can devise technology to place men on the moon and bring them back safely can find ways to prevent oil pollution. With the incentive to do so, it will be done. Solving our energy needs creates that incentive and the necessity for invention

Having said all this - does it all sound plausible? By analogy it seems to.

When oil was discovered in the U.K. sector of the North Sea in 1969, the technology in offshore structures and other systems did not exist to cope with the enormous sea-state forces and violence of this fierce environment. Yet nowhere is the scale and pace of offshore oil development in harsh environments more impressive than in the North Sea. Many of the platforms installed to act as permanent oil production centers are the largest marine structures ever made by man. Yet they were conceived, designed and installed within four years after their need was recognized by the oil discoveries in the northern and deeper waters of the North Sea.

As indicated earlier there are a number of indicated similarities between the Kopanoar oil reservoir in the

COMPARISON OF FORTIES, KOPANOAR AND TAR SANDS

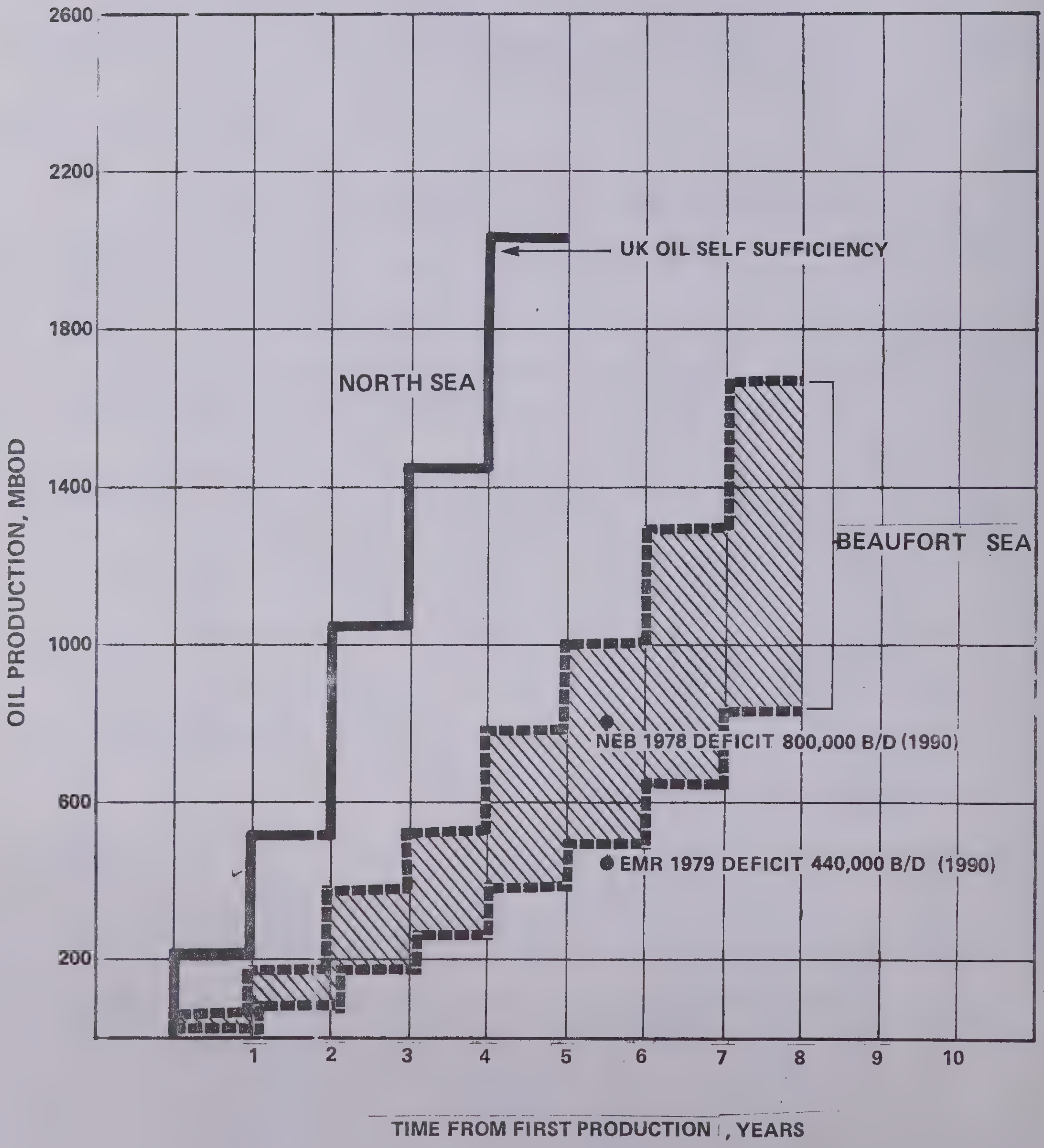
ITEM	FORTIES (UK, North Sea)	KOPANOAR (Beaufort Sea)	TAR SANDS (Athabasca)
Geological/Reservoir			
Discovery Date	October 1970	September 1979	--
Discovery Well Test in Barrels of Oil per day (BOPD)	4730 BOPD	6050 BOPD	--
Structure Area	22,250 Acres	21,000 Acres	--
Recoverable Reserves	1.8 Billion Bbls	1 to 2 Billion Bbls	1.1 Billion Bbls
Development			
Discovery to First Production	5 years	6 years	--
Capital Cost (1980 $)	$3.65 Billion	$6.0 Billion	$5.0 Billion
Est. Production	500,000 BOPD	410,000 BOPD	130,000 BOPD
Development Cost ($/BOPD)	$7,300	$15,000	$37,700

Beaufort Sea and the Forties Field which was discovered in 1970 and was placed on production some five years later. Production levels at Forties reached 500,000 seven years from the date of discovery. The estimated development cost of Kopanoar is twice actual cost for Forties. Thus our costs appear directionally correct and still show strong economic merit by being substantially lower than the next tar sands plants.

It is expected that if Kopanoar and other discoveries are found to be commercial in the Beaufort Sea, it will be possible to have the first production to markets by 1985 and to achieve oil sufficiency in Canada by 1990. The U.K. achieved self-sufficiency levels of 2 million BOPD in 1979, nine years after the discovery of oil and five years after the start of oil production. If the Beaufort Sea were to develop from one-half to 1 million BOPD in a nine year period it would be a substantially lesser achievement than that accomplished in the North Sea in the same time frame, but could still provide oil sufficiency for Canada. Again it appears reasonable.

If Canadians take a course which results in grim energy shortages in the future, it will be one of choice. Other courses exist which can give us energy security.

OIL PRODUCTION RATE COMPARISON
NORTH SEA & BEAUFORT SEA



One such course is via our offshore frontiers. Policies which encourage action to explore for oil, enlarge knowledge and create technology to work safely there, offer the prospect of the best of both worlds - environmentally safe frontiers and energy to meet our needs.

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